

PATENT COOPERATION TREATY

REC'D 06 MAY 2005

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From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2005/050198

International filing date (day/month/year)
18.01.2005

Priority date (day/month/year)
22.01.2004

International Patent Classification (IPC) or both national classification and IPC
H01L23/46, H01L23/467, H01L23/473, F04B43/04

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/050198

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the International application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-33
	No: Claims	-
Inventive step (IS)	Yes: Claims	2,20
	No: Claims	1,3-19,21-33
Industrial applicability (IA)	Yes: Claims	1-33
	No: Claims	-

2. Citations and explanations
see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:
D1: EP-A-0 483 469 (HEWLETT-PACKARD COMPANY) 6 May 1992 (1992-05-06)
D2: US-A-5 288 214 (FUKUDA ET AL) 22 February 1994 (1994-02-22)
D3: US 2002/050148 A1 (SHYY WEI ET AL) 2 May 2002 (2002-05-02)
D4: US-B1-6 272 866 (TSAI MING-JYE ET AL) 14 August 2001 (2001-08-14)
2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 3-18 and 21-33 does not involve an inventive step in the sense of Article 33(3) PCT.
 - 2.1 Each of documents D1 (see the abstract; claims 1 and 9) and D2 (see the abstract; col. 1, line 24 - col. 2, line 5) discloses a micropump for fluids comprising a heat-driven pumping element (D1: diaphragm 28; D2: gel medium 12). Although not explicitly stated in these documents, it is known to the skilled person that this kind of micropumps is highly suitable to be used in the field of cooling electronic devices by means of fluids, as becomes apparent from documents D3 (see e.g. "BACKGROUND OF THE INVENTION" on page 1) and D4 (see e.g. "BACKGROUND OF THE INVENTION" on cols. 1 and 2). Merely by using the micropump of D1 or D2 for pumping cooling fluids to, or from an electronic device, the skilled person would inevitably meet the subject-matter of independent claims 1 and 12 without exercising any inventive skill.
 - 2.2 Dependent claims 3-11, 13-18 and 21-33 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.
3. The combination of the features of claims 1 and 2 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows: Although

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AUTHORITY (SEPARATE SHEET)**

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heat-driven micropumps for fluids are known from documents D1 and D2, these documents do not give any particular indication as to how to use these pumps for cooling electronic devices. Since none of the remaining documents of the International Search Report discloses a heat-driven pump, to use the heat generated by an electronic device to drive a pump for the cooling of this device is something that cannot be derived from any combination of documents of the International Search Report.

The same consideration applies to a combination of the subject-matter of claims 12, 19 and 20.